FOREIGN AGRICULTURE

August 17, 1970

Coffee Rust in Latin America

Foreign
Agricultural
Service
U.S. DEPARTMENT
OF AGRICULTURE

FOREIGN AGRICULTURE

VOL. VIII • No. 33 • August 17, 1970

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This week's cover:

American coffee pathologist Dr. Frederick Wellman inspects leaves infected with coffee rust in Brazil. For an account of the discovery of coffee rust in the Americas and the counteraction initiated see story beginning this page.

Use of funds for printing *Foreign Agriculture* has been approved by the Director of the Bureau of the Budget (May 1, 1969). Yearly subscription rate, $10.00 domestic, $13.00 foreign; single copies 20 cents. Order from Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

Coffee Rust and

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On January 27 of this year Dr. Arnaldo Gomez Medeiros, a plant pathologist of the National Cocoa Institute of Brazil, during a routine inspection tour of cocoa plantations in Bahia in eastern Brazil, noticed coffee trees infected with what appeared to be *Hemileia vastatrix*, commonly called coffee rust. This serious fungus disease of coffee-plant leaves is present in many parts of Asia and Africa, but Dr. Medeiros' discovery was the first notification of its having gained a firm foothold in the Western Hemisphere.

Brazil, which grows more coffee than any other country in the world, was understandably concerned. Further, the coffee grown in Brazil and in other countries in the Western Hemisphere—Arabica—is particularly susceptible to coffee rust.

The first step was to make sure of the correctness of the original diagnosis. Plant pathologists from the Brazilian Coffee Institute visited Bahia to examine and collect material, and samples of infected coffee leaves were flown to Portugal to be examined by Dr. Branquinho d'Oliveira, one of the world's most noted authorities on diseases affecting coffee plants. He confirmed that the Brazilian coffee leaf disease was *Hemileia vastatrix*.

Later, the leaves were identified as having Race II of the disease. One of the complicating factors in controlling coffee rust is the large number of types, or races, known—currently 26.

Next, the Brazilian Government moved swiftly and energetically to determine as accurately as possible the area of infestation and at the same time began an investigation of what would be the most appropriate measures to control and, if possible, to eradicate the disease.

As of mid-June survey teams had identified occurrences of coffee rust in an area about 800 miles long and 200 miles wide that includes part of southern Bahia and northeast Minas Gerais and much of Espírito Santo. This block of land is about the same size as all of the Central American countries combined. Within this block stands of coffee trees affected by rust are surrounded by other groups of trees as yet undiseased. Such scattered occurrence of the disease will possibly complicate control measures.

In beginning its investigation of appropriate measures for control of coffee rust, the Brazilian Government, in addition to mobilizing its own resources, requested international cooperation by experts in the field of coffee pathology. Among those responding were Dr. Frederick Wellman, formerly with the U.S. Department of Agriculture and now a visiting pathologist at North Carolina State University, and Dr. Russell Desrosiers, a pathologist of the U.S. Agency for International Development (AID), stationed in Brazil. Through AID's

Countermeasures in the Americas

cooperation, both Dr. Wellman and Dr. Desrosiers were able to tour coffee areas in Brazil and contribute their experience toward developing an effective control program.

As a more formal step toward international coordination of efforts to solve the coffee rust problem, a technical conference on coffee rust was called by the Inter-American Institute of Agricultural Sciences at Turrialba, near San José, Costa Rica. The conference lasted for 5 days (June 29 through July 3) and scientists from Central and South American coffee-producing countries were present as well as scientists from other concerned countries, such as the United States and Portugal. In addition, observers from the coffee industry, the UN Food and Agriculture Organization, and AID were present.

Because most Latin American countries grow coffee and some depend upon coffee exports for large parts of their foreign exchange earnings, the seriousness to Latin American economies of the possible spread of coffee rust was readily recognized. The conference urged that all possible measures be taken to prevent the spread of the disease in the Western Hemisphere.

A plan was submitted to the conference by the Inter-American Institute of Agricultural Sciences that would provide for cooperation to study the disease and its relation to coffee plants, to study the effect of environment on the development and virulence of the disease, to assist in quarantine measures, to provide information and educational resources to producing countries, and to develop through breeding and selection coffee varieties that have both high quality and resistance to coffee rust.

A short history of coffee rust

The occurrence of *Hemileia vastatrix* was first noted over a century ago near Lake Victoria in Africa. By 1870 it had appeared in Ceylon—then the world's major coffee-producing country. In succeeding years the disease spread with great rapidity through southern India, the islands of Sumatra and Java, and certain other islands in the Pacific and Indian Oceans. Later it appeared in the Philippines, Mainland China, and the island of Madagascar.

By the early 1950's the disease was present in 32 countries of the Eastern Hemisphere. Despite quarantine measures coffee rust had spread to five more countries—all in West Africa—by 1960 and during the 1960's appeared for the first time in Angola.

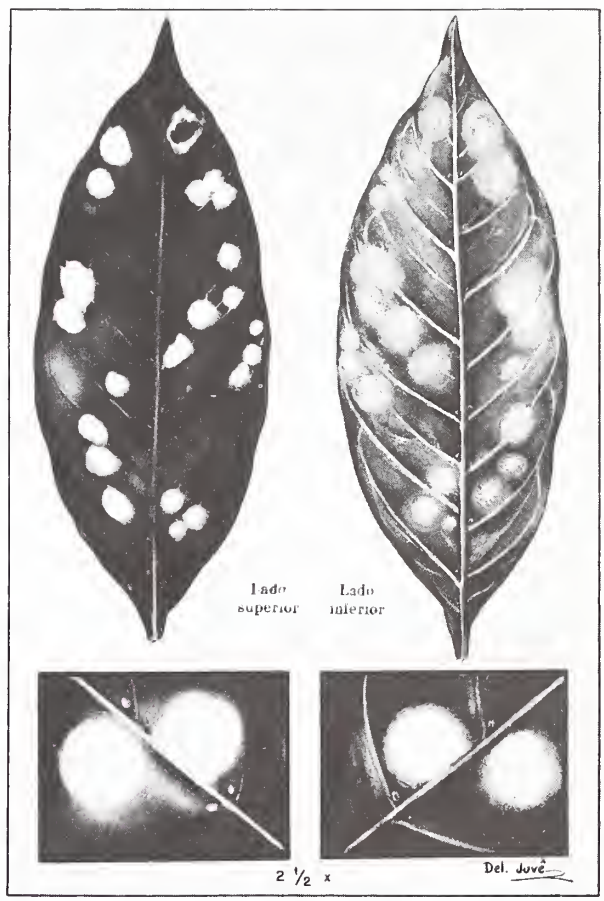
Wherever the disease has appeared, radical changes have occurred in local coffee industries in a short time. In Ceylon coffee growing was abandoned and the country turned to tea production. In other areas growers have ceased trying to cultivate the fine-flavored but rust-susceptible Arabica coffee and have replaced it with Robusta coffee (a different species). Robusta, though producing coffee beans inferior in quality to Arabica beans, is highly tolerant of rust.

Nature of the disease

Hemileia vastatrix is a fungus whose only host is the coffee plant. Like other fungi, it cannot synthesize its own food but must absorb it from a host. As the fungus absorbs food and multiplies on a coffee leaf, it causes damage. The effect of the disease is to cause severe defoliation of the coffee plant and therefore a decrease in yield since there is a definite relation between the number of leaves on a coffee tree and the number of coffee beans it can mature. After several years, the affected coffee tree dies.

Coffee rust can be identified in the field by the round orange-yellow spots that form on the undersides of the leaves of coffee trees. These spots are masses of spores, by means of which the disease is propagated. One spot on a leaf (and there may be thousands on a single tree) can produce well over 100,000 spores.

Spores detach into the air and are carried by winds, air currents, rains, insects, packing materials, or man from one place to another. They are very hardy and can withstand months of unfavorable conditions awaiting a favorable mo-



Far right, leaflet distributed to coffee farmers picturing leaf symptoms of coffee rust.

Near right, symptoms of coffee rust on a handful of leaves picked from diseased trees.

ment in the right location to reproduce.

Because of the possible economic danger to Brazil from coffee rust and the known difficulty of containing or eradicating the disease, Brazil has decided to move forward simultaneously on several methods of dealing with the problem.

Brazil's first rust-control moves

As an initial step, large numbers of technicians are being trained to recognize coffee rust, and all the coffee areas of Brazil are being surveyed to determine the extent and rapidity of the spread of the disease. To enlist the assistance of individual Brazilian farmers, thousands of leaflets describing the disease and depicting the symptoms in color have been prepared and are being distributed.

At the same time, the National Academy of Sciences of Brazil has organized a rust commission under the leadership of one of the country's outstanding coffee specialists—Dr. Carlos Krug.

A sanitary strip to separate the diseased region in the north from other coffee-producing areas to the south is being developed. The area in which the disease has been found till now is not a major coffee-producing area and contains mostly low-yielding trees producing inferior qualities of coffee. The short-term effect of diminished coffee production in this area on Brazil's total coffee economy would be slight. However, areas to the south of the sanitary strip in southern Minas Gerais and in São Paulo and Paraná are major coffee-growing areas.

The proposed sanitary zone would be a strip about 250 miles long and 30 miles wide within which all coffee trees would be destroyed. About $9 million has already been made available by the Brazilian Coffee Institute to finance this and other programs of protection and control.

Chemical sprays

Another avenue of control being explored by the Brazilian Government in collaboration with public and private institutions is spraying coffee plants with chemical substances that kill coffee rust. Field tests of new chemical materials are now being conducted.

Spraying is a widely practiced method of control in other rust-infected countries, and in some areas, such as Kenya and India, it has given effective check to the disease at supportable cost. In many areas, however, spraying has been a failure commercially because of the irregular distribution of rains and the absence of a long dry season. (Moisture and heat favor the multiplication and spread of rust.) Unfortunately, in much of the Western Hemisphere coffee-growing areas rains are fairly frequent and irregular and the number of spray applications required to achieve good control might be prohibitively expensive. It has been suggested, however, that Brazil's major coffee States—São Paulo and Paraná—may be areas where spraying would be feasible because of their cooler temperatures and lower rainfall.

Technical problems also need to be solved in the application of spray to coffee plants. Coffee rust first appears on the leaves of the lowest branches of coffee plants, and the spores are dispersed from the undersides of the leaves. Therefore, spray must be applied in a way that insures these areas are covered. It has been suggested that in certain areas aerial spraying from helicopters might do the job of spray application effectively at a reasonable cost.

In general, although chemical sprays have not been uniformly successful in the past, they have good possibilities for the control of coffee rust. Rapid advances are being made in spraying techniques, the compounding of new sprays, and cultivation practices that facilitate maximum spray effectiveness.

Resistant strains

The ideal solution to the invasion of the Western Hemisphere by coffee rust would be the development of new strains of Arabica coffee that would combine resistance to known races of rust with high yields of good-quality coffee beans. Plant breeding, however, is a slow process for a tree crop.

Work on this problem, however, is already in progress at various research stations in the Western Hemisphere—notably Campinas (Brazil), Turrialba (Costa Rica), and Chinchina (Colombia). Already it is known that differences are great in rust susceptibility between different coffee strains.

Perhaps the most experienced country in the field of breeding for rust resistance is India, whose research stations have been selecting, crossbreeding, and hybridizing different types and species of coffee for approximately 50 years. These efforts have produced a number of cultivars showing high rust resistance (at least initially) combined with good commercial qualities. It is because of such work that India has continued to be a significant producer of Arabica coffee. Some of the Indian strains, especially Kent, have been widely planted in East Africa. They are now being replaced, however, by other

The Importance o

Latin America grows and sells more coffee than any other area of the world. In 1969 its coffee sales were 65.3 percent of world coffee exports. (Other important coffee exporters were Africa, with 29.7 percent of the world market, and Asia and Oceania, with 5 percent.)

Nearly every Latin American country grows some coffee, but a few are outstanding in volume and quality. Brazil, for example, is the world's chief coffee seller and provided 35.4 percent of total world exports in 1969. Brazil sells chiefly Unwashed Arabica coffee—a mainstay in many coffee blends. Colombia is the second-ranking world coffee seller with 12.1 percent of the market. Colombia sells high-quality Arabica coffee beans that are particularly mild and flavorful. El Salvador, Guatemala, and Mexico also sell mild coffee, and their share of world coffee markets are, respectively, 3.5 percent, 3.2 percent, and 2.9 percent.

Coffee sales are of great importance to the foreign exchange positions of many Latin American countries. In 1968 coffee sales provided 16.3 percent of total foreign exchange earned by major Latin American coffee-producing countries.

Some countries, however, are particularly dependent upon coffee sales. In 1968 coffee provided 67.7 percent of all foreign exchange earned by Colombia, 42.7 percent of El Salvador's, 41.2 percent of Brazil's, 38.9 percent of Haiti's, 33 percent of Guatemala's, 31.4 percent of Costa Rica's, 17.9 percent of Ecuador's, 14 percent of Nicaragua's, 12.6 percent of Honduras', 11.9 percent of the Dominican Republic's, and 6.3 percent of Mexico's.

Coffee growing, handling, and selling is also a major source of employment in many coffee-growing countries and is of great economic importance to the internal economies of Latin American countries. The accompanying chart shows how

varieties as their resistance to rust diminishes—owing, most probably, to genetic changes in races of coffee rust.

In the past, however, research on resistant coffee strains was not pursued with great vigor in the Western Hemisphere. The complete absence of coffee rust, which some attributed to natural environmental factors, diminished the sense of urgency needed to make rapid progress. Even after 1960, when the delegates to the first Food and Agricultural Organization Technical Meeting on Coffee Production, held at Abidjan, Ivory Coast, listed expansion of research on and testing for *Hemileia* resistance as a project with high priority, research on rust was not accelerated.

Now, however, with the problem of *Hemileia vastatrix* of particular consequence to the future of coffee production in the Western Hemisphere, action on producing resistant strains should go into high gear. A greatly expanded Center for Coffee Rust Research is to be established in Brazil, and it is certain that other Latin American countries will also initiate research programs.

Undoubtedly Ethiopia, with its great diversity of types and strains of Arabica coffee showing different degrees of rust resistance, could furnish plant material to form the basis of new, accelerated research.

Role of the United States

Actually, much coffee plant material from India and Ethiopia has already been made available to various research stations in the Western Hemisphere since 1952 through the cooperation of the United States.

Under the auspices of the United States Government, two U.S. coffee scientists visited most major coffee-producing countries in the world in 1951, collected seeds and other plant materials of resistant coffee varieties, and studied coffee rust. The collected material was introduced to the United States under strict quarantine measures and was the beginning of a reservoir of rust-free but resistant coffee plants.

The United States, which has been concerned about the possibility of coffee rust appearing in the Western Hemisphere for almost 20 years, established a program at the U.S. plant introduction station, Glenn Dale, Md., whereby over 50,000 coffee plants of introductions from Africa and Asia were grown between 1952 and 1960 and distributed to primary cooperating research stations in South and Central America. The plants were grown under a cooperative arrangement between the U.S. Department of Agriculture and the U.S. Agency for International Development.

In addition, collections of potentially valuable coffee types were established and are still maintained by the U.S. Department of Agriculture at its Plant Introduction Station at Miami, Fla.

Further, funds were furnished to extend facilities at the Coffee Rust Research Institute in Portugal for testing coffee plants for rust resistance and at the same time to systematize the known types of the fungus disease coffee rust.

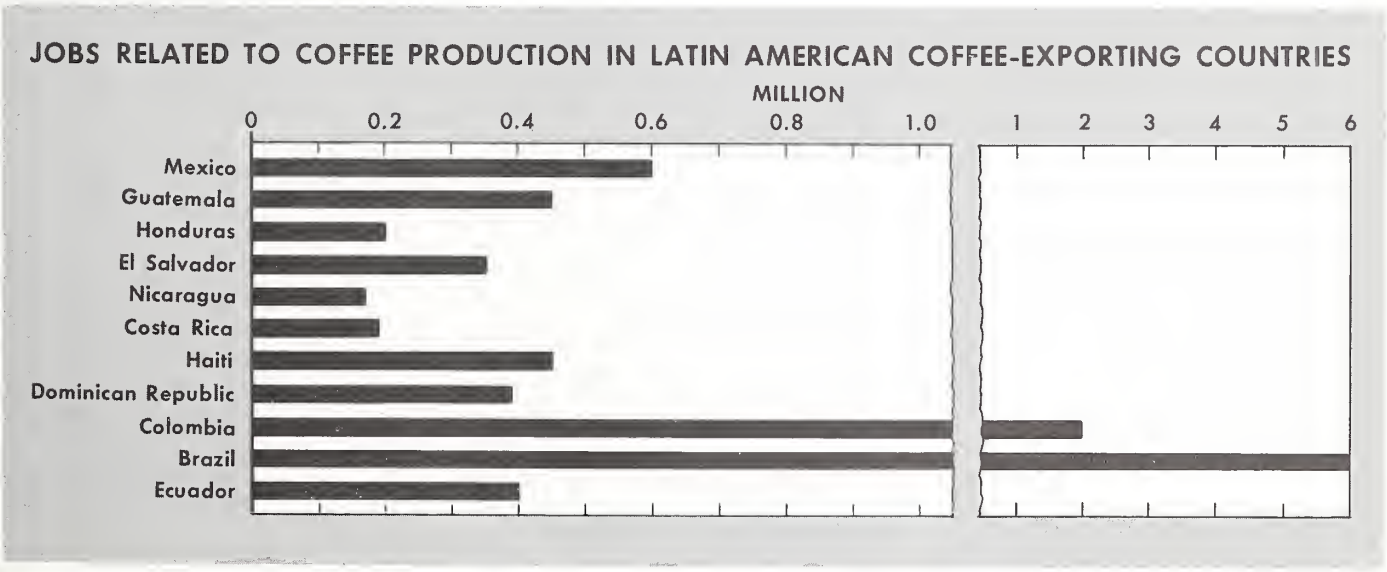
offee to Economies in the Western Hemisphere

many people depend on coffee for a livelihood.

On the consumer side in the Western Hemisphere, the United States dwarfs all other importers. In 1969 the United States took well over half of all coffee exports from Latin America and 39.4 percent of world coffee exports. The United States has only small areas where it is climatically feasible to raise coffee commercially.

The majority of coffee imported into the United States is of the Arabica type, which is the chief ingredient in standard coffee blends in present U.S. retail coffee. (In 1969, 65 percent of U.S. coffee imports were Arabica types from Latin America.) But in recent years there has been a growing trend toward Robusta coffee imports from Africa and Asia; Robusta coffees are used in small amounts in regular U.S. coffee blends, and most instant (or soluble) coffees are made largely from Robusta beans. The trend toward U.S. imports of Robustas has, however, leveled off and may well decline in the future as freeze-dried coffees become more popular. Freeze-dried coffees utilize mostly Arabica beans.

But no matter what the type of coffee purchased, the large supplies of coffee now marketed by Latin American countries decide the price the U.S. housewife pays for coffee.



A Review: The Netherlands, Its Agriculture

The Netherlands is one of the world's smallest and most crowded countries. Its industry and agricultural trade are similar in that both are primarily conversion-type operations which are heavily dependent on imports of raw materials and semi-finished products from abroad.

The port of Rotterdam is Europe's, and the world's, largest grain receiving harbor and a major transshipment point for other European destinations. In recent years, with some variations, about 6 million tons of grain were received annually, more than half being transshipped. Amsterdam handles about one-third this volume with half being transshipped. In 1968, 3.2 million metric tons of American grain went into Dutch ports; about 45 percent was transshipped.

In 1968, an estimated one-half of Dutch agricultural production was sold abroad. Food and other agricultural products comprise almost 30 percent of total exports and more than 25 percent of total imports; the Netherlands produces roughly one-fifth more food than needed for domestic consumption.

Land in farms. With a total of 6.3 million acres under cultivation (Jan. 1, 1969), the Netherlands stands first in farm acreage in comparison with its immediate neighbor Belgium and with nearby Luxembourg. This acreage is small, however, compared with France, Germany, and Italy, the agricultural giants of the EC.

In 1968 the cultivated land was divided as follows: 59 percent in permanent pastures and meadows, 5 percent in horticulture, and 33 percent in arable land.

Size of farms. Dutch agriculture is characterized by relatively small farms and intensive cultivation. Some 90 percent of Dutch farmland is in holdings of fewer than 50 acres and nearly 54 percent of those have fewer than 10. Farms in clay regions, particularly along the coasts, average 100 acres with some reaching 250 acres. In the sandy regions of the country many small farms still occur, but through mergers of small holdings, farms up to 40 acres are common.

Farm labor. In 1968, 8.0 percent of the civilian work force of some 4.4 million was engaged in agriculture (including forestry and fishing). A government program to encourage mechanization, soil-improvement schemes, and consolidation of farm holdings is producing a decline of more than 10,000 persons a year.

Farm income. Agriculture (including forestry and fishing) accounted for 7.5 percent of the gross national product of $28.0 billion. Per capita incomes are increasing and farm incomes are out-pacing wages paid in manufacturing. In recent years, the average farm had a gross income of more than $4,500 annually. This is about double the gross income 10 years ago. Net income in recent years was about half the gross income.

Crops. The Netherlands' agricultural prosperity is due to the ingenuity of its engineers and farmers rather than to natural causes. The soils of the country are not naturally suited for crop raising, and high yields have been the result of high rates of fertilizer application—the highest countrywide level of application in the world—coupled with intensive reclamation and drainage projects. The overall volume of agricultural production has increased rapidly, 40 percent in the past decade.

Fruit output in 1969 was mixed. A large 1969 Dutch apple crop—approximately 500,000 tons—coincided with similarly large crops in other European countries to glut the market. The result was low prices. Conversely, the pear crop was about half the 1968 crop and prices recovered from the low of the previous year.

Weather during the 1969 crop growing season was somewhat unusual. Although statistics reveal little variation from normal patterns of rain and sunshine, alternating wet and dry periods had adverse effects on some crops.

Spring wheat and oats, especially in the northern provinces, suffered sprout

Country as a Whole—Geography, Economy, Food Consumption

The Netherlands has faced many enemies during its existence, but the most persistent is the North Sea, which continually gnaws at the approximately 1,500 miles of dikes which keep the cold, gray water in its proper place. One-fourth of the country lies below sea level, the average elevation being just 37 feet above the water.

One of the most densely populated nations in the world (about 1,000 people per square mile) the Netherlands crams some 13 million people into 13,000 square miles—an area about the combined size of Massachusetts, Connecticut, and Rhode Island. The Netherlands has as its neighbors the Federal Republic of Germany on its east and Belgium on its south. To the west and north of the Netherlands lies the North Sea.

The country's compact size makes for a climate free of regional extremes; it is only 196 and 125 miles, respectively, at its longest and widest points. The proximity of the North Sea moderates the weather and results in a mean temperature of 36.7°F. in winter and 65.1°F. in summer.

Primarily an industrial country, the Netherlands imports most of its raw materials, and many semifinished products to feed its factories. In 1969, the Dutch gross national product was $28.0 billion, a 12.5-percent increase over the previous year. Agriculture, forestry, and fishing contributed 7.5 percent of the total.

Other activities and their contributions to the GNP were mining, manufacturing, construction, and public utilities, 49.0 percent; trade, 16.5 percent; transportation and communications, 9.0 percent; and other services 18.0 percent.

The Dutch people eat well; the average person in 1967-68 had a daily consumption of 3,170 calories, 84 grams of protein, and 153 grams of fat. This compares with the average American intake of 3,140 calories for the same period.

Within the European Community, the Netherlands had (in 1967-68) the highest per capita consumption of sugar, milk, and cocoa; in rice consumption it ranked second, and it ranked third in consumption of eggs, cereals (except for bread grains, where it ranked fourth), potatoes, vegetables, and fruit.

The average Dutch family spends about 25 percent of its total annual expenditure for food. This compares with about 17 percent in the United States. Dutch food bills have risen more than 20 percent since 1964.

damage at harvesttime after being subjected to wet weather. In total, 1969 output of grains at 1.6 million metric tons was about 2.3 percent lower than the 1968 output of 1.7 million tons.

Area under wheat has increased largely as a result of higher producer prices. Oats-growing area is decreasing. Large potato crops are grown for human consumption, for seed, and for commercial preparations such as potato starch, flour, glucose, and dextrine.

Sugarbeets and fodder are grown in the north, northwest, and southwest. Some traditional crops—like madder, chicory, hemp, and even flax—have either vanished or are in decline.

Livestock. Animal husbandry is mainly concerned with the production of milk and allied products. There is also considerable breeding and exporting of dairy cattle (especially the famed Dutch Friesian cows). The supply of beef for home use is obtained from the dairy herd.

The Netherlands farmer raises two kinds of pigs: the Dutch pork pig, bred chiefly for the home market, and the bacon and ham pig for export.

Animal numbers continued to increase in 1969, moderately for large animals, but the poultry sector expanded strongly in the last half of 1969 and the prospects are good for continued strong expansion in 1970. All cattle were up 4.3 percent, from 3.9 million in July 1968 to 4.1 million in July 1969. Of this latter figure, 1.8 million were milk cows.

Pork, beef, and other red meat production fell slightly in 1969 compared to 1968. Veal production increased about 9.7 percent to an estimated 86,900 tons. Meat production in 1969 was down 0.7 percent under the 1968 figure of 891,500 metric tons.

Red meat production in 1970 is expected to be about 4 percent over the 1969 level with pork output supplying the larger part of the gain. Producer prices are expected to remain favorable but pork prices should move downwards from the extremely high levels of 1969.

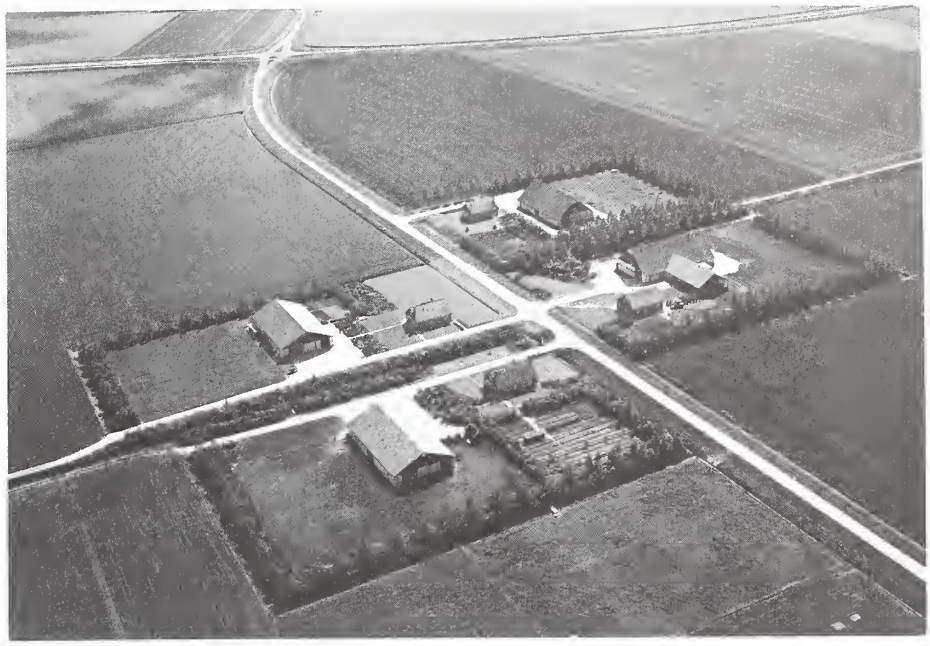
The poultry industry is booming. The Netherlands is the major poultry supplier for the EC. It is estimated that broiler numbers during the second half of 1969 were 14 to 15 percent greater than the comparable period of 1968. Layer numbers were estimated to have been more than 20 percent higher in the last half of 1969, compared with a year earlier, overall layer numbers going from 220 million in October 1968 to 268 million in 1969.

Foreign trade. Most Dutch agricultural trade is regulated by the Common Agricultural Policy (CAP) of the European Community, of which the Netherlands has been a member since its inception. The basic principle of the CAP is "Community preference." Since the inception of the CAP, Dutch agricultural trade with other EC members has increased 225 percent while agricultural trade with nonmember countries has increased by only 145 percent. (The years of comparison are 1961 and 1968.)

Total imports into the Netherlands increased from $9.2 billion in 1968 to $10.9 billion in 1969 (both c.i.f. figures). During the same period, total exports (f.o.b.) rose from $8.3 billion to $9.9 billion, an increase of 19.5 percent. In 1969, agricultural products accounted for 27.0 percent of total exports.

The balance of payments position in 1969 showed an average deficit of $18.1 million on a current account basis. This is in contrast to a surplus of about $70.3 million in 1968.

Information on this and the opposite page supplied by Brice K. Meeker, U.S. Agricultural Attaché, The Hague.



Farms from the sea. Fifteen years ago this land in East Flevoland was under water. Dikes were built, the area pumped. Today it is an important producer of cereals, sugarbeets, and potatoes. (Photo courtesy of the Dutch Ministry of Agriculture.)

Livestock and Poultry, 1969 [1]

Kind of animal	Number	Meat production [2]
	1,000 head	*1,000 metric tons*
Cattle	4,161	284
Pigs	4,907	588
Sheep, lamb	[3] 552	8
Horses	[3] 110	5
Poultry	[3] [4] 49,445	[5] 260

[1] July 1969 unless otherwise noted. [2] Carcass weight. [3] May 1969. [4] Includes hens and chickens, and ducks. [5] Ready-to-cook basis. *Maandstatistiek van de Landbouw* and reports by U.S. Agricultural Attaché, The Hague.

Major Farm Imports
From the United States, 1969

Product	Value
	Million dollars
Animal and animal products	23.6
Poultry and poultry products	1.3
Grains and preparations	109.1
Fruits, nuts, and preparations	22.3
Vegetables and preparations	4.6
Oilseeds and products	172.4
Cotton, raw, excluding linters	2.7
Tobacco, unmanufactured	22.6
Other	40.1
Total	398.7

Principal Crops, 1969

Crop	Area	Production
	1,000 acres	*1,000 metric tons*
Wheat	384	677
Rye	153	207
Barley	245	405
Oats	202	336
Mixed grains	15	21
Potatoes	358	4,607
Sugar beets	255	5,000

Production Végétale, No. 14, 1969, and reports by U.S. Agricultural Attaché, The Hague.

Clockwise from the bottom, man exa (ragi); women harvesting finger millet,

Millet—Increasing H

Millet, a nutritious small-seeded grain, is relatively little known in the United States, where it is grown solely for feed. Yet because millet can be cultivated under hot, dry conditions that most other crops will not tolerate, it has been a staple of the human diet in certain regions of the world—Africa (where most millet species originated), China (where millet was grown as early as 2700 B.C.), and India (where it is both food and feed). India, in fact, is the world's leading grower of millet, and its 40 million millet acres provide 11 percent of its cereal grain.

Some 60 million of India's people—out of a population of approximately 524 million—depend on millet for most of their food; and their animals live chiefly on the fodder. Studies made in India have shown that the better millet strains compare favorably with wheat, corn, and rice in their content of fats, minerals, and protein.

Once the possibilities of millet are more fully explored, it may play a larger role in India's agriculture than it has during the last decade of research and experimentation. Attention is especially turning—at the beginning of India's fourth 5-year plan—to the drier three-fourths of the country, which has heard much about the "green revolution" but has experienced little of it.

Millet has some unique merits as a dryland crop: It is nutritious for both man and his animals; it has relatively few insect pests; it is resistant to drought; it tolerates extreme heat; and it will produce a crop even on poor soils. Further, it can often yield as much as sorghum or corn, if grown under equally favorable conditions. Pearl millet, India's most drought-resistant cereal, has been known to turn out a little grain even where the soil is only 6 inches deep on top of rock.

lk of pearl millet (bajra); women marching to harvest finger millet f finger millet; women transplanting finger millet to irrigated land.

for India's Drylands

From 1959 to 1962, two different collecting teams scoured India for different types of millet (and also sorghum). Millet breeders in India, utilizing the research of an American geneticist, were able to use an inbred line, called Tift 23A, to produce a number of commercially successful hybrids. The best of these hybrids did so well, even in the face of record drought, that the All-India Millet Workers Conference held in February 1965 unanimously voted to release it under the name Hybrid Bajra (Pearl) No. 1.

Hybrid Bajra No. 1 (HB-1) thus became not only the first approved pearl millet hybrid in India but also the first to be grown commercially anywhere in the world. Enough seed was available for planting 4,000 acres in 1966, and now there is enough seed for everybody who wants it.

Farmers found that it had several advantages in addition to high productivity. At demonstration-plantings organized by the Ministry of Agriculture it produced a more uniform stand: its grain was of the accepted slate or steely-blue color; its foliage was leafy and stayed green after harvest; it tillered profusely, and the stems were succulent and also somewhat sweet, characteristics that added to its value as a livestock feed. As an unexpected bonus, HB-1 was resistant to downy mildew or green-ear disease, a major problem with pearl millet in India and also seemed relatively immune to attack by most insects.

Some of the farmers achieved yields of 3,500 to nearly 6,000 pounds an acre, where fertilizer and water were ample, and one in western Gujarat claimed a phenomenal 8,000 pounds per acre—all this compared with the national average of 350 to 400 pounds.

In the three States of Mysore, Andhra Pradesh, and Tamil Nadu (formerly Madras), as well as in scattered spots elsewhere, including the Himalayas, a quite different kind of millet is a diet mainstay, not only for the poor but also for some of the well-to-do. This is finger millet *(ragi)*, so called because it produces its small seed on five to seven or more "fingers," which comprise the head.

Indian women grind it into flour from which they make a sort of cake, a porridge, and dough balls. Finger millet is also used in malting. The seed is usually reddish brown but can vary all the way from purple to white. The latter color is prized by Indian consumers who prefer almost any grain to be pearly white.

Finger millet is highly regarded as a food by people who do heavy manual work because it seems unusually sustaining. It is also considered an excellent food for expectant mothers, because of its high calcium content. Although it is relatively low in protein, some of the newer varieties have tested up to 11 percent—the level of some of the pearl millet.

There are 5.5 million acres of finger millet in India. Its grain yields average 800 pounds per acre—double the average for pearl millet—and under exceptional circumstances, with use of an improved variety, yields of up to 7,000 pounds have been recorded.

Although finger millet is a dryland crop for the most part, it is often transplanted and raised under irrigation, where it works well in a multiple-cropping system. It is not unusual to see women planting finger millet in a field from which only 10 days before they were carrying off big bundles of winter wheat.

In the long run, while India's total millet acreage may decrease, its total millet grain production will undoubtedly increase, and the grain will be used more and more for India's growing livestock and poultry industries.

—Adapted from a special report on India by The Rockefeller Foundation

Recent Agricultural News From India

The five articles on the following two pages deal with events and developments in India and all were based on dispatches written by James H. Boulware, U.S. Agricultural Attaché in New Delhi, India.

India Unveils 5-Year Plan

India's Fourth 5-Year Plan, recently received by Parliament, advocates spending $5.08 billion—nearly a quarter of the plan's total funds—on public sector agricultural programs. (Public-sector agricultural programs in India are government-financed farmer-assistance programs.) In contrast, estimates for the Third Plan, just ended, indicate that $2.33 billion, or about a fifth of that plan's total, were spent for public-sector agricultural programs.

Plan to cost $33 billion

In all, the Fourth Plan proposes spending a total of $33.16 billion—$21.19 for activities in the public sector and $11.97 billion for those in the private sector.

The Fourth Plan—April 1, 1969-March 31, 1974—is oriented toward the development of socioeconomic projects to benefit the more disadvantaged segments of the population. These will include programs to assist small farmers and to promote dry farming and rural employment.

An examination of proposed Fourth Plan public-sector outlays for agriculture shows increases in most farming activities when compared to the fundings of the same activities in the Third Plan.

Plan proposes more money for agriculture

The greatest percentage of increase in the Fourth Plan's agricultural portion of the public sector is proposed for the related fields of research and education. If the Plan is accepted in its present form, funds for these activities are scheduled to increase from $1.3 million to $113.3 million. Three other agricultural activities that may see major increases are animal husbandry, with a 200-percent increase in funds, to $125.3 million; dairying and milk supply, with a 400-percent increase to $185.3 million; and fisheries, with a proposed 300-percent increase to $110.6 million.

In addition, funds are proposed for three new agricultural projects: Development of small farmers and agricultural labor ($153.3 million), central government support to financial institutions ($432.0 million), and buffer stocks of agricultural commodities ($340 million).

Targets of production

The hoped-for results of these expenditures will be large-scale increases in commodity production. The Fourth Plan calls for a 50-percent increase in grain sorghum, from 10.0 million tons to 15.0 million, and a 48-percent gain in cashew nut production, from 352 million pounds to 520 million pounds. The largest percentage of increase in production envisaged by the Plan is in the production of pepper: an 83-percent gain, from 50 million pounds to 92 million pounds. A 33-percent increase in cotton production (to 8.0 million bales) and a 29.0-percent rise in tobacco production (to 990 million pounds) are also foreseen. If all production targets are met, there will be increases in the production of 15 of India's major crops.

The rate of increase in production of foodgrains and major commercial crops envisaged in the Fourth Plan is much higher than that actually achieved in the past. Because the prospects of bringing additional new land under cultivation are limited, success of crop-output growth depends primarily on intensive agriculture. To achieve the target of increased foodgrain production, the Fourth Plan proposes that about 61.3 million acres be put under high-yielding varieties by 1973-74, against about 22.2 million acres in 1968-69.

Multiple cropping necessary for success

To obtain optimum results from the use of high-yielding varieties, old programs are being extended and new ones being tried. A series of new multiple-cropping cycles have been evolved and tested and should have a significant bearing on future production. In addition to quick-ripening varieties of principal cereal crops, crop rotations have been evolved to increase oilseeds, potatoes, and vegetables.

SELECTED FOURTH PLAN TARGETS OF AGRICULTURAL PRODUCTION

Commodity	Base-level production 1968-69	Production target 1973-74	Percentage increase
	Million tons	*Million tons*	*Percent*
Rice	39	52	33.3
Wheat	18	24	33.3
Corn	6.2	8	29.0
Pulses	12.5	15	20.0
Oilseeds	8.5	10.5	24.0
Sugarcane	12	15	25.0

The Plan's target for multiple cropping in 1973-74 is 37.0 million acres compared to 14.8 million in 1968-69. Total fertilizer consumption in 1973-74 is expected to rise from 1.6 million tons to 5.5 million tons. In the same period, more than 2,600 pumps are scheduled to be in operation, more than 2½ times the total for 1968-69.

Indian Rains May Boost Acreage

The on-time arrival of India's southwest monsoon is likely to cause farmers there to boost their acreage in comparison to last year's planted area. According to officials of the Indian Ministry of Agriculture, the area under cultivation this year is likely to be substantially greater than in 1969. The abundant moisture is enabling farmers to prepare fields and to plant summer crops under very favorable conditions.

The rains arrived on the day they were expected or a few days ahead of that date in most areas and covered practically the entire country by the end of June. The monsoon's progress so far in the current season (which lasts from June to September) has been favorable in most of India. Cumulative rainfall during June was normal or above normal in all the country's weather districts except in interior Mysore and in the islands of the Bay of Bengal and the Arabian Sea. The level of rainfall this year compares favorably with the rainfall position in June of 1968 and 1969 when large areas of

the country were said by Indian meteorologists to have "deficient" or "scanty" rainfall patterns.

Rain which was recorded as normal or above fell during the week of July 8 in 10 Indian States or parts of States. Elsewhere the weather was dry, but the overall position on that date was markedly favorable. In fact, the timely, well-distributed June and early July rains have given farm operations a good start and have raised hopes for a "normal" monsoon for the fourth consecutive week.

India Buying Damaged Wheat

India's program to purchase 3.7 million tons of the approximately 20-million-ton 1969-70 domestic wheat crop may have received an unwelcome boost from rains that fell while wheat was being harvested in much of the north Indian wheat belt. The unseasonal rains, from late May through June 17, damaged the wheat in the fields there and the Government of India decided to purchase it to provide relief to farmers who were having problems marketing it.

Much of the grain harvested after the rains exhibited some sprout damage; there was also some discoloration. Because visual appearance is a key factor in selling wheat in India, traders were reluctant to buy wheat that was less than perfect. The government's food agency was also reluctant to purchase the grain because it did not meet the agency's standards. This left the farmers with much grain they could not sell, except at substantial discounts.

In view of this, the Government of India decided to change its standards to make possible the purchase of the rain-damaged wheat by the Food Corporation and other government agencies. The relaxation in wheat specifications, combined with the reluctance of buyers to use off-colored grain, should result in the Food Corporation's acquiring a larger portion of the crop than it would have if there had been no sprout damage.

Although 70-75 percent of India's wheat procurement must be completed during the period April-June—prior to the onset of the monsoons—wheat purchases in some States had been low in April and May. Market arrivals of wheat had been negligible in April and were below expectations in the first half of May. They were higher in the second half of May, but procurement had fallen behind expectations in the Punjab, Uttar Pradesh, and Madhya Pradesh. Thus, although this year's countrywide procurement target is 1.3 million tons larger than the amount of wheat the government purchased last year, the actual tonnage of wheat procured by the end of May 1970 was only 100,000 tons more, 1.4 million tons compared with 1.3 million last year.

Wheat procurement by the various government entities in the Punjab up to June 20 totaled 1.75 million tons against a state procurement target of 2.4 million tons. Procurement in Haryana up to the same date totaled 325,000 tons against a revised state target of 400,000 tons.

India Sets Grain Supports

The Government of India in late June announced the minimum support prices for the 1970-71 season of paddy (rough rice), grain sorghum, spiked millet, corn, and a type of small millet known as ragi. The minimum support price for the standard variety of paddy has been set at the equivalent of $2.78 per 100 pounds; for grain sorghum, spiked millet, corn, and ragi, at $2.72 per 100 pounds. The new prices have been established on the recommendation of the Agricultural Price Commission and represent an increase of 13 cents for the grains listed, compared to the prices for the 1969-70 season. Minimum support prices for classifications of paddy other than the standard variety will be fixed by the several State governments in consultation with the Government of India and will depend on the quality of the grain.

Prices for normal procurement of foodgrains by the government will be announced before the harvest after assessing crop prospects, market trends, availability and prices, needs of the public distribution system, and the buffer stocks. In practice, minimum procurement prices, which are always higher than the minimum support levels, serve as the effective support prices.

Indian Cotton Traders Protest Nationalization Threat

The Indian Government proposals to take over, or "canalize" cotton imports effective next September and eventually to nationalize domestic trade in raw cotton are meeting with strong resistance in the country. Approximately 3,000 representatives from the cotton trade and the textile industry, cotton growers, and officials of cooperatives and labor unions from all over India met in New Delhi June 22-23 to protest the government's plan. On the opening day the Bombay commodity markets closed to express agreement with the stand taken by the convention's delegates; cotton trading was suspended for the 2 days of the conference.

Various delegates to the convention attacked the Indian Government for what they said were unnecessary actions being taken for political reasons.

(At a different meeting on June 22, Prime Minister Indira Gandhi said that the cotton trade was not being nationalized for political reasons but to free it from the grasp of "a few monopolies.")

The convention delegates unanimously approved several resolutions which stressed that—

- The government has no sound and convincing reasons to disturb the status quo.
- The present system under which only mills are allowed to import cotton under individual quotas is in itself a sophisticated form of canalization.
- The expertise of the trade that had been developed over generations would be lost if imports were taken over by the government.
- Unemployment would result from a government takeover.
- A ban on future trading (put into effect by the government in 1966) should be removed.
- Adequate credit facilities should be made available to all cotton-marketing sectors to provide funds at a better rate of interest.
- The present arrangement served the interests of the farmers and also enabled mills to obtain cotton to suit their individual needs on a highly competitive basis.

Conference delegates decided to form a permanent federation of the cotton trade to protect the trade's interests and to help cotton growers increase production.

Improved diets, increased use as animal feed will create a greater world demand for wheat in the next decade. The result will be greater production and larger imports. Competition in the wheat trade will continue to be keen.

Report Studies 1980 World Wheat Outlook

The demand for wheat in many nonproducing countries is expected to expand rapidly in the next decade and increased imports will be necessary to meet this demand. This is one of the conclusions in a major economic report published recently by the U.S. Department of Agriculture's Economic Research Service.

Entitled *World Demand for Wheat in 1980, With Emphasis on Trade by the Less Developed Countries,* the report projects into the next decade the world wheat demand, supply, and trade. Other major conclusions are that—

- Concerted efforts by LDC's to produce wheat for export will strain the ability of world markets to absorb the excess wheat and will result in lower wheat prices.
- Some LDC's (in regions such as North Africa and west Asia) will absorb their own increased production.
- Diets in LDC's will be improved on a calorie basis.
- More wheat will be used for feed purposes.
- There is an implied need for continued concessional export transactions and for some form of aid, particularly to those regions where present and foreseeable wheat technology precludes increased wheat production.
- The LDC's (which include both exporting and importing countries) will find it difficult to agree on policy objectives because lower prices would benefit the importers but adversely affect the earnings of the exporters.
- Competition in world grain trade will remain keen with supplies exceeding the growth in demand.

Report centered around 1980

The report looks at wheat production, demand, trade, prices, and export earnings or costs, centered around 1980. Four basic sets of projections were made based on differing assumptions about production trends and trade policies. The projections take into account changes in prices, consumer incomes, population, personal tastes and preferences, and agricultural technology. These factors are the major determinants of the ebb and flow of production and consumption.

During the period from 1955-56 through 1966-67, wheat production increased in all study regions except Japan, Communist Asia and eastern South America. Total world wheat area increased by 4 percent, with the largest increases taking place in Australia. Area declined in the United States, the European Community, other Western European nations, Japan, Eastern Europe, Communist Asia, North Africa, Central America, eastern South America, and western South America. Wheat yields generally increased in all regions examined by the study, and total wheat production increased 16 percent. The largest yield increases took place in Mexico, Eastern Europe, and the United Kingdom.

Wheat is a complex grain

Recognizing that wheat is a complex commodity, differing in chemistry, milling characteristics, and suitability for given products, the report views demand factors as they grow out of consumer income, population growth, and changing tastes. It recognizes that demand for the various qualities of wheat differs within and between countries. It also acknowledges that demand sometimes shifts from one quality or class of wheat to another.

The study asserts that wheat is the grain most widely traded on an international basis. It further states that wheat trade supplements the domestic grain supplies of some countries, complements those of other countries, and for nonwheat producing countries is the only source of wheat. Using 1964-66 throughout the report as a period of reference, the study puts into perspective the world wheat trade during that period. It examines changes in the historical pattern of trade and explains various international and regional trade arrangements.

Conclusions grew out of projections

The first set of projections (unbalanced world trade) is based on the assumption of constant relative prices. This view projects what will happen in 1980 if the relationships between prices, supply, demand, and the wheat trade remain approximately as they were in the 1964-66 reference period. Under these conditions, large trade surpluses occur.

The remaining three basic projection sets were done by a World Grain Model—an econometric model developed to evaluate potential supply-demand prospects and export earnings or import costs for wheat, rice, and coarse grains—and are based on the assumption that the United States, Canada, and Australia will adjust their supplies to maintain buoyant world trade prices. These three sets differ with respect to production functions for less developed countries. The first is based on continuing policies and includes the impact of the "Green Revolution." The second set's production level is higher; and the third set's is lower. The first and second sets have subsets which are based on an assumption that the United States, Canada, and Australia will take whatever action is necessary to maintain a share of the export market.

Other ERS reports available

In addition to *World Demand Prospects for Wheat in 1980,* the USDA's Economic Research Service also issued three other major international trade and demand studies during 1970. These were: *Japan's Food Demand and 1985 Grain Import Prospects, World Demand Prospects for Agricultural Exports of Less Developed Countries,* and *Growth in World Demand for Feed Grains: Related to Meat and Livestock Products and Human Consumption of Grains, 1980.* An earlier 5-volume series under the title, *World Trade in Selected Commodities,* 1959-65, published world trade data for beverage crops; food and feed grains; textile fibers; sugar, fruits and vegetables; and oilseeds, oil nuts, and animal and vegetable oils. Copies of this five-part study as well as the titles later published are available from the Division of Information, Office of Management Services, U.S. Department of Agriculture, Washington, D.C. 20250.

CROPS AND MARKETS SHORTS

Livestock and Meat Product Exports

The value of U.S. livestock and meat product exports in June was $52.6 billion—up 28.2 percent from last year. Most of this increase was due to greater tallow and grease exports.

Exports of inedible tallow and greases, at 230.0 million pounds, were 48.9 percent larger than in June last year. Exports to Japan, largest U.S. market for inedible tallow and greases, were off, but for the first half of 1970 exports to Mexico, the Netherlands, and Pakistan more than offset the fall in shipments to Japan. Edible tallow and grease exports in June totaled 2.5 million pounds—more than four times their year-earlier level.

Exports of cattle parts (cattle hide pieces other than croupons) were down 72.2 percent from the 3.4 million pounds exported last year. Although exports of cattle parts to each of the major U.S. markets during the first half of 1970 were below their level of a year earlier, the greatest drop was in Italy, the largest market. Through June, cattle part exports to Italy totaled 1.0 million pounds, compared with 4.1 million during the same period last year.

The value of livestock and meat product imports was $110.5

U.S. EXPORTS OF SELECTED LIVESTOCK PRODUCTS

Commodity	June 1969	June 1970	January-June 1969	January-June 1970
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Animal fats:				
Lard	15,433	18,780	120,437	161,454
Tallow and greases:				
Inedible	154,487	230,003	999,063	1,132,917
Edible	596	2,466	7,114	10,233
Meats:				
Beef and veal	2,046	2,425	13,270	14,561
Pork	12,568	3,499	84,222	21,310
Lamb and mutton	51	126	885	521
Sausages	327	436	2,635	2,032
Meat specialties	268	242	2,073	1,909
Other canned	569	830	4,961	4,206
Total red meats [1]	15,825	7,563	108,043	44,539
Variety meats	18,396	23,078	105,991	112,012
Sausage casings (animal origin)	884	987	5,556	6,193
Animal hair, incl. mohair	2,409	1,839	10,117	8,682
Hides and skins:				
Cattle parts	3,427	951	17,637	6,719
	1,000 pieces	*1,000 pieces*	*1,000 pieces*	*1,000 pieces*
Cattle	1,063	1,394	7,133	8,007
Calf	128	89	741	513
Kip	45	8	242	110
Sheep and lamb	268	391	1,787	1,859
Horse	5	22	31	85
Goat and kid	9	11	176	122
Livestock:	*Number*	*Number*	*Number*	*Number*
Cattle and calves	2,774	2,215	18,394	15,948
Sheep, lambs, and goats	12,798	11,992	68,758	64,168
Hogs	1,167	1,487	10,075	8,499
Horses, asses, mules, and burros	1,383	1,331	5,419	34,685

[1] May not add due to rounding.
Bureau of the Census.

U.S. IMPORTS OF SELECTED LIVESTOCK PRODUCTS

Commodity	June 1969	June 1970	January-June 1969	January-June 1970
Red meats:				
Beef and veal:	*1,000*	*1,000*	*1,000*	*1,000*
Fresh, chilled, or frozen:	*pounds*	*pounds*	*pounds*	*pounds*
Bone-in beef	1,655	1,476	8,980	13,470
Boneless beef	78,877	81,769	437,996	523,354
Cuts (prepared)	127	1,290	883	5,304
Veal	1,715	2,195	13,695	12,676
Canned beef:				
Corned	7,087	7,659	40,889	44,357
Other, incl. sausage	1,419	2,840	7,973	14,157
Prepared and preserved	9,499	4,643	30,916	29,436
Total beef and veal [1]	100,380	101,875	541,330	642,751
Pork:				
Fresh, chilled, and frozen	3,910	5,835	24,254	29,093
Canned:				
Hams and shoulders	20,502	22,467	121,307	128,679
Other	2,217	3,458	13,873	17,472
Cured:				
Hams and shoulders	72	94	623	669
Other	517	332	1,849	2,067
Sausage	352	247	1,665	1,667
Total pork [1]	27,569	32,432	163,574	179,650
Mutton and goat	3,490	7,370	23,985	31,192
Lamb	3,154	1,613	19,511	20,137
Other sausage	622	805	4,108	5,401
Other meats	922	1,237	5,967	9,360
Total red meats [1]	136,139	145,330	758,471	888,486
Variety meats	325	872	2,047	4,812
Edible and inedible tallow and grease	1,090	717	7,572	3,696
Meat extract	7	108	472	515
Wool (clean basis):				
Dutiable	8,269	9,258	52,890	52,338
Duty-free	6,463	7,784	43,072	35,004
Total wool [1]	14,732	17,040	95,961	87,342
Animal hair	716	98	4,059	1,389
Hides and skins:				
Cattle parts	68	222	118	846
Sheep skins pickled and split	775	1,019	5,053	6,416
	1,000 pieces	*1,000 pieces*	*1,000 pieces*	*1,000 pieces*
Cattle	26	39	142	201
Calf and kip	54	67	309	305
Buffalo	34	8	231	105
Sheep and lamb	1,645	1,439	13,996	11,355
Goat and kid	695	153	2,862	2,586
Horse	10	36	110	109
Pig	64	32	371	488
Livestock:	*Number*	*Number*	*Number*	*Number*
Cattle [2]	42,654	91,992	485,002	669,012
Sheep	27	74	1,634	1,822
Hogs	952	7,249	4,623	26,266
Horses, asses, mules, and and burros	242	376	1,607	1,554

[1] May not add due to rounding. [2] Includes cattle for breeding.
Bureau of the Census.

billion—up 17.6 percent from last year.

Red meat imports, at 145.3 million pounds, were up 6.8 percent from last year. Greater pork, mutton, and goat meat imports accounted for most of the increase. Pork imports totaled 32.4 million pounds—up 17.6 percent from June 1969, while mutton and goat meat imports at 7.4 million pounds were more than double their year-earlier level.

An interesting development thus far in 1970 has been the increasing quantity of beef and veal imports for consumption entering in the form of prepared cuts. For the first 6 months of 1970, imports of prepared beef cuts reached 5.3 million pounds, compared with only 900,000 pounds during the same period last year. Nicaragua and Honduras, with 2.1 million pounds and 1.8 million pounds, respectively, were the largest suppliers in the first half of 1970.

Variety meat imports totaled 900,000 pounds—more than double last year's June takings. Total variety meat imports for the first 6 months of 1970 were 4.8 million pounds—up from the 2.0 million pounds during the same period last year.

Edible and inedible tallow and grease imports continued their downward trend in June. At 700,000 pounds, they were down 34.2 percent from last year.

In the live animal category both live hog and live cattle imports showed substantial gains in the first half of 1970. Live cattle imports, predominantly feeder cattle from Mexico, totaled 669,012 head for January-June, compared with 485,002 head for the same period last year. Because of improved feedgrain conditions in Canada and favorable U.S. prices, U.S. imports of live hogs from Canada at 26,266 head for the first half of 1970 were almost six times greater than for the same period in 1969.

June U.S. Tobacco Exports Down

U.S. exports of unmanufactured tobacco in June 1970 were 42.3 million pounds for a value of $38.7 million. In June 1969 tobacco exports totaled 55.5 million pounds at a value of $49.8 million. For the 6-month period January-June 1970 exports were down about 2.8 percent from the same period a year ago. A total of 210 million pounds in the 6-month period compares with 216 million in the same months of 1969 and 244 million in 1968. The declared value of $191.5 million for the January-June period remained about the same as in the same 6 months of 1969, but was off nearly 8 percent from 1968.

U.S. EXPORTS OF UNMANUFACTURED TOBACCO
[Export weight]

Kind	June		January-June		Change from
	1969	1970	1969	1970	1969
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*Percent*
Flue-cured	42,696	26,141	157,800	142,251	−9.9
Burley	4,933	8,080	22,615	23,189	+2.5
Dark-fired Ky.-Tenn.	1,649	3,326	8,076	9,437	+16.9
Va. fire-cured [1]	421	686	1,861	2,419	+30.0
Maryland	1,223	904	5,603	5,628	+.4
Green River	93	115	395	293	−25.8
One Sucker	42	86	113	316	+179.6
Black Fat	95	234	311	1,312	+321.9
Cigar wrapper	181	295	1,424	877	−38.4
Cigar binder	206	9	360	94	−73.9
Cigar filler	69	58	392	202	−48.5
Other	3,933	2,373	17,459	24,310	+39.2
Total	55,541	42,307	216,409	210,328	−2.8
	Mil. dol.	*Mil. dol.*	*Mil. dol.*	*Mil. dol.*	*Percent*
Declared value	49.8	38.7	191.5	191.5	—

[1] Includes sun-cured. Bureau of the Census.

Exports of tobacco products in June 1970 were valued at $18.7 million, about the same as in June 1969. In the 6-month period January-June 1970 the value of tobacco products reached $90.3 million, an increase of 31 percent over the same period of 1969. Most of the increase was due to larger exports of cigarettes.

U.S. EXPORTS OF TOBACCO PRODUCTS

Kind	June		January-June		Change from
	1969	1970	1969	1970	1969
Cigars and cheroots					*Percent*
1,000 pieces	6,343	4,610	33,731	26,485	−21.5
Cigarettes					
Million pieces	2,958	3,120	11,273	14,842	+31.7
Chewing and snuff					
1,000 pounds	3	20	16	46	+187.5
Smoking tobacco in pkgs.					
1,000 pounds	134	65	550	437	−20.5
Smoking tobacco in bulk					
1,000 pounds	2,858	1,452	8,658	8,474	−2.1
Total declared value					
Million dollars	18.6	18.7	68.8	90.3	+31.3

Bureau of the Census.

Turkey Sells Surplus Tobacco Leaf

The Turkish Tobacco Monopoly recently sold 13,000 tons (about 29 million lb.) of surplus old-crop stocks of tobacco to two U.S. concerns at reduced prices and on credit. The smaller sale was in exchange for tinfoil needed by the monopoly in its domestic operations. The larger transaction was made at prices 15 percent lower than those previously quoted and on a 3-year credit arrangement.

These recent transactions represent a new effort by the Turkish Government to deal with the mounting surplus tobacco problem. They have provoked protest from local tobacco merchants who have repeatedly encouraged production control of the Turkish tobacco crop in recent years.

Annual production has exceeded domestic and export requirements in Turkey for a number of years. The resulting surplus of exportable stocks, recently estimated at approximately 180,000 tons (nearly 400 million lb.), is taxing storage facilities and creating high retention costs.

The recent sales, though relatively small in volume, represent a significant departure from past monopoly policy, according to which Turkey engaged in barter transactions with countries that had bilateral agreements with it, but refused to negotiate sales of tobacco on credit or at reduced prices. Earlier efforts to liquidate large quantities of the surplus stocks through transactions with bilateral-agreement countries failed to show significant results.

Turkey annually produces about 325 million pounds of tobacco, primarily oriental aromatic varieties, and exports from 150 million pounds to 175 million pounds. The United States is the major customer, receiving approximately 100 million pounds or about 60 percent of exports each year.

U.S. Exports of Cigarettes Rise

U.S. exports of cigarettes during fiscal year 1969-70 continued to rise, increasing by 10.7 percent to a total of 28.5 billion pieces, compared with 25.8 billion in 1968-69 and 23.5 billion in the 1967-68 fiscal year. The value of cigarette exports reached a new high of $151 million, almost 16 percent higher than the previous year and more than one-fourth greater than during the 1967-68 fiscal year.

Hong Kong continued to be the major market, receiving over 2.6 billion pieces or 17 percent of the total even though shipments were 10 percent less than in the previous year. Other major markets to which shipments continued rising included Switzerland, Panama, Colombia, Kuwait, and Saudi Arabia, each receiving over 1 billion pieces. Spain, the Netherlands Antilles, and Belgium-Luxembourg received smaller shipments. Shipments to Paraguay—a major market 3 years ago, taking over 2 billion pieces then—continued to decline—down to 720 million pieces during fiscal 1970.

U.S. EXPORTS OF CIGARETTES[1]

Destination	1967-68	1968-69	1969-70	Change from 1969-70
	Million pieces	*Million pieces*	*Million pieces*	*Percent*
Hong Kong	2,442.5	2,951.0	2,646.4	−10.3
Switzerland	504.7	1,183.2	1,871.6	+58.2
Spain	1,619.1	1,631.2	1,517.8	−7.0
Panama	892.6	1,089.4	1,507.0	+38.3
Colombia	343.7	1,145.1	1,433.1	+25.2
Netherlands Antilles	1,555.6	1,404.7	1,385.5	−1.4
Kuwait	1,143.5	1,193.2	1,342.5	+12.5
Saudi Arabia	17.0	458.3	1,129.1	+146.4
Belgium-Luxembourg	485.4	1,224.2	1,093.5	−10.7
Italy	692.8	571.0	790.3	+38.4
Paraguay	2,013.8	751.2	720.4	−4.1
Canary Islands	393.7	642.6	712.1	+10.8
Netherlands	394.5	579.2	633.0	+9.3
Japan	441.0	535.2	629.4	+17.6
Lebanon	661.7	562.6	620.3	+10.3
Yugoslavia	427.1	436.5	610.4	+39.8
West Germany	657.2	568.1	572.4	+.8
Uruguay	92.1	288.5	566.4	+96.3
Singapore	520.4	538.8	540.5	+.3
United Kingdom	321.2	402.4	501.8	+24.7
Australia	476.4	330.1	389.6	+18.0
Denmark	523.3	309.5	374.4	+21.0
France	611.5	357.1	361.0	+1.1
Israel	216.3	281.1	333.0	+18.5
Mexico	337.9	401.9	324.0	−19.4
Other	5,729.3	5,934.9	5,932.8	—
Total	23,514.3	25,771.0	28,538.3	+10.7
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*Percent*
Total value	118,242	130,866	151,381	+15.7

[1] Fiscal year. Bureau of the Census.

Record 1969 World Corn Output

The 1969 world corn crop totaled 248 million metric tons. This was 8 percent above the 1968 crop and 3 percent above the previous record of 1967.

Larger harvests occurred in all major regions of the world. The U.S. crop was 4 percent more than in 1968 but still 4 percent below the 1967 record. Major gains were registered by Argentina, Brazil, South Africa, Europe, and the USSR. The Mexican harvest, by contrast, suffered from serious drought. A detailed table and analysis appeared in the July *World Agricultural Production and Trade—Statistical Report.*

CORN PRODUCTION IN SELECTED AREAS[1]

Area	1968	1969
	1,000 metric tons	*1,000 metric tons*
United States	111,595	116,282
Mexico	8,500	6,500
Argentina	6,860	9,440
Brazil	10,808	14,000
Western Europe	12,419	13,840
Eastern Europe	19,900	23,148
USSR	7,400	9,900
South Africa	4,953	6,978
Other	46,549	45,008
World total	228,984	248,096

[1] Harvest year covers Northern Hemisphere harvests plus Southern Hemisphere harvests that end early in the following year.

Weekly Rotterdam Grain Price Report

Current prices for imported grain at Rotterdam, the Netherlands, compared with a week earlier and a year ago, are as follows:

Item	August 5	Change from previous week	A year ago
	Dol. per bu.	*Cents per bu.*	*Dol. per bu.*
Wheat:			
Canadian No. 2 Manitoba	1.96	+1	1.91
USSR SKS-14	(1)	(1)	1.83
Australian Prime Hard	(1)	(1)	1.87
U.S. No. 2 Dark Northern Spring:			
14 percent	1.91	−2	1.85
15 percent	1.96	+1	1.91
U.S. No. 2 Hard Winter:			
13.5 percent	1.83	+1	1.83
Argentine	(1)	(1)	(1)
U.S. No. 2 Soft Red Winter	1.71	+4	1.64
Feedgrains:			
U.S. No. 3 Yellow corn	1.67	+3	1.41
Argentine Plate corn	1.76	0	1.64
U.S. No. 2 sorghum	1.62	+11	1.32
Argentine-Granifero	1.42	−12	1.37
Soybeans:			
U.S. No. 2 Yellow	3.19	−13	2.67

[1] Not quoted.
Note: All quoted c.i.f. Rotterdam for 30- to 60-day delivery.

Crops and Markets Index

Too Many Apples in the Netherlands Fruit Market

Apples are in overabundant supply on the Dutch fruit market. The Dutch have laid the blame on European Community (EC) overproduction, which has caused low apple prices throughout the EC—and especially on France. According to the Netherlands Fruit Growers Association, France has accounted for 42 percent of EC production increases in the past 15 years.

This spring Dutch growers withheld their apples from intervention hoping that market prices would go up. (Intervention is a system whereby the government through authorized agencies can withdraw supplies from commercial markets to maintain prices; growers are reimbursed through FEOGA—the EC's Agricultural Guidance and Guarantee Fund.)

At the end of May, when prices had not risen and the intervention was scheduled to end, the Dutch Agricultural Board asked the EC for a 1-month extension of the intervention. During the extra month, growers hoped that prices would rise as stocks held by the Central Bureal of Horticultural Auctions—48,200 metric tons in mid-May, compared with 17,400 tons in 1969, and 21,500 tons in 1968—were worked down. But, with most apple stocks of relatively poor quality, the Dutch consumer has too many alternative fruit choices to be forced into buying apples of less desirable quality at high prices.

In late May an estimated 5,000 Netherlands fruit growers demonstrated in The Hague against the serious difficulties in the fruitgrowing industry in Holland. The demonstration was orderly and the crowd made little noise. It was, however, packed with signs attacking the Dutch Agricultural Ministry, Common Market policy, and the French. There were also signs requesting that shipments of French apples into the Netherlands be suspended.

Apples are grouped for EC intervention purposes according to the established 3 quality classes—Class I, II, and III Golden Delicious (Class I) may be brought into intervention when market prices fall to $12.15 per hundred kilograms (about 220 lb.). Class II and III apples, whose intervention prices depend upon those of Class I, could not—before March 1970—be brought into intervention until Class I prices fell below the intervention level. In March, however, as a concession to growers and because the great bulk of the apple supply is in Class III, a ruling was made that Class II and III apples could be turned over to the intervention agency when market prices of these classes fell below intervention prices, even though market prices of Class I were still above the intervention level.

The March action led to the removal of some apples. The EC Commission has ruled that intervention apples may not be destroyed and must be disposed of for social purposes, i.e., given away to institutions such as hospitals. The Dutch have found this completely impractical and "several thousand tons" have been quietly fed to cattle.

In short, it is one of those cases, rare so far, where Common Market policy is hurting the Dutch. However, in view of the benefits derived by Dutch agriculture from the European Community, it is unlikely that the fruit growers have much chance of impressing the Dutch Government, although they have obtained a few palliatives.

—Based on dispatch from BRICE K. MEEKER
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